

WHAT IS CLAIMED IS:

1. A thermal spray coating method, comprising:  
recording, controlling, and/or monitoring at least one characteristic of the thermal spray coating method affecting the quality of the coating layer by creating images with a digital camera; and

assigning the images of at least one region of equal intensity and/or at least one region within a particular intensity interval to one or more symmetric geometrical surface regions by computer processing or encoding.

2. A thermal spray coating method according to Claim 1, wherein said at least one characteristic of the thermal spray coating method affecting the quality of the coating layer is selected from the group consisting of gas flows, current strengths, spraying distance, spraying angle, a velocity of a coating jet relative to a substrate surface, and a quantity of sprayed powder.

3. A method according to Claim 1, wherein said assigning comprises recording the one or more symmetric geometrical surface regions as a data record based on independent typical characteristics of the respective geometric shape.

4. A method according to Claim 3, further comprising recording, monitoring, and/or controlling at least one of the

~~characteristics of the thermal spray coating method affecting~~  
the quality of the coating layer by means of the data record.

5. A method according to Claim 1, wherein the symmetric geometrical surface regions are selected from the group consisting of circles, squares, rectangles, parallelograms, ellipses, and combinations thereof.

6. A method according to Claim 1, wherein the symmetric geometrical surface regions are ellipses.

7. A method according to Claim 3, wherein the independent typical characteristics are recorded as a data record for the respective geometrical shape.

8. A method according to Claim 1, wherein the computer processing and/or encoding is carried out by at least one of a contour detection algorithm, a gradient steps representation, or a gradient accentuating representation reduced to bit planes.

9. A method according to Claim 1, wherein the at least one characteristic of the thermal spray coating method affecting the quality of the coating layer relates to at least one of the spray coating method or a spraying device.

~~10. A method according to Claim 3, further comprising~~  
controlling or optimizing one or more parameters of the  
thermal spray coating process with the symmetric geometrical  
surface region or the data record.

11. A method according to Claim 3, further comprising  
documenting one or more characteristics affecting the quality  
of the coating layer and/or the spray coating method using the  
symmetric geometrical surface regions or the data record.

12. A device for quality assurance of a thermal spray  
coating layer on the surface of a substrate, comprising:

a digital camera for recording, controlling, and/or  
monitoring at least one characteristic of the thermal spray  
coating method affecting the quality of the coating layer in  
digital images;

a computer processing and/or encoding device; and

means for assigning at least one region of equal intensity  
and/or at least one region within a particular intensity  
interval in the digital images to one or more symmetric  
geometrical surface regions by said computer processing and/or  
encoding device.

13. A device according to Claim 12, wherein said means  
for assigning comprises means for recording the one or more  
symmetric geometrical surface regions as a data record based

~~on characteristics of the respective geometric shape and said~~  
device further comprises means for recording, controlling  
and/or monitoring at least one characteristic of the thermal  
spray coating method affecting the quality of the coating  
layer.

14. A device according to Claim 13, further comprising  
means for controlling or optimizing one or more parameters of  
the thermal spray coating based upon the data record.

15. A device according to Claim 13, wherein the device  
comprises means for documenting one or more of the  
characteristics affecting the quality of the coating layer  
and/or the spray coating method using the symmetric  
geometrical surface regions or the data record.

16. A computer program product for use with a digital  
camera producing a digital image of an event, said computer  
program product comprising:

a computer usable medium having computer readable  
program code means embodied in said medium for causing the  
assignment of a digital image from the camera to a series of  
relationships between particular intensity levels of the image  
and particular geometrical surface regions in order to monitor  
the quality of the event, said computer program product  
having;

computer readable program code means for causing a computer to effect, with respect to each image, a determination of the boundaries of various intensity levels of said image;

computer readable program code means for causing said computer to store in an array values representing the boundaries of the various intensity levels of said digital image and means for causing said computer to compare said stored boundary values of said images with stored values for one or more symmetric geometrical surface regions and to chose the closest matches for each of said various intensity levels resulting from said comparison;

computer readable program code means for causing said computer to determine a plurality of characteristics of said chosen symmetric geometrical surface regions and compile a listing of said characteristics as a data base in order to monitor quality of the event.

17. The computer program product according to claim 16, wherein the event is a thermal spray coating.

18. The computer program product according to claim 16, wherein said symmetrical geometrical surface regions are ellipses.

19. A program storage device readable by a machine tangibly embodying a program of instruction executable by the machine to perform method steps for monitoring the quality of

~~thermal spray coating of a substrate, said method steps~~

comprising:

producing digital images of a thermal spray coating of a substrate;

storing said digital image and determining boundary values of regions of intensity of said digital image;

comparing said boundary values with a plurality of symmetric geometrical surface regions and determining ones of said geometrical regions which most closely match boundary values of said regions of intensity of said stored digital image;

characterizing said selected ones of said symmetric geometrical surface regions as a function of size and position;

compiling a list of characteristics based on said size and position of said selected geometrical regions and providing a database which serves as a monitor of the characteristics of the thermal spray coating.

20. The program storage device according to claim 19, wherein said symmetric geometrical regions are ellipses.

21. The program storage device according to claim 20, wherein said characteristics include at least one of a vertical position of the ellipse, center-out-mass, a horizontal position of the ellipse center-out-mass, a length of first and second semi-axes, and an angle of one of the semi-axes to the horizontal.

22. ~~The computer program product according to claim 18,~~  
wherein said characteristics include at least one of a vertical  
position of the ellipse center-out-mass, a horizontal position  
of the ellipse center-out-mass, a length of first and second  
semi-axes, and an angle of one of the semi-axes to the  
horizontal.